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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/542,772

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Kenichi Miyoshi

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12/28/2007

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EXAMINER

SAMUEL, DEWANDA A

ART UNIT

PAPER NUMBER

2616

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/542,772

Applicant(s)

MIYOSHI ET AL.

Examiner

DeWanda Samuel

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7 and 8 is/are allowed.
- 6) ☒ Claim(s) 1 and 3 is/are rejected.
- 7) ☒ Claim(s) 2 and 4-6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claim 1** is rejected under 35 U.S.C. 103(a) as being unpatentable over Dolgonos et al. ( US Patent 7,002,934) in view of Uskali et al. (US Patent 6,735,423) and Belotserkovsky et al. ( US Patent 6,628,735).

**With regard to claim 1**, Dolgonos et al. discloses having an *OFDM signal collision position detection apparatus that detects collision positions of OFDM signals transmitted from a plurality of cells, comprising: a known signal measuring section that measures reception power of a known signal*; Dolgonos et al. discloses having a wireless communication system 10 plurality 14(1)-(n) receives wireless communications signal from a corresponding coverage area of base station receivers

14(1)-(n), each of which receives wireless communications signals from a corresponding coverage area, or cell 16(1)-(n)...the coverage area including a number of factors such as the strength of the transmitted signals received (column 3 line 4-24). Dolgonos et al. further discloses the communication system 10 uses multiple sub-carrier modulation techniques such as orthogonal frequency division modulation (OFDM, column 3 line 40-). In addition, Dolgonos et al. discloses having a detecting and measuring each branch sub-carrier complex amplitude which includes the signal and power (column 8 line 54-67 and column 9 line 1-67).

*a data signal measuring section that measures reception power of a data signal;* Dolgonos et al. discloses having a detecting and measuring each branch sub-carrier complex amplitude which includes the signal and power ("data signal measuring section", column 8 line 54-67 and column 9 line 1-67).

*a data signal prediction section that predicts reception power of the data signal based on the measured reception power of the known signal; a power comparison section that compares the reception power of the data signal predicted by said data signal prediction section with the reception power of the data signal measured by said data signal measuring section for each subcarrier;* Dolgonos et al. discloses having a detecting and measuring ("data signal measuring section") each branch sub-carrier complex amplitude of the noise and power (column 8 line 54-67 and column 9 line 1-67). However, Dolgonos et al. does not disclose having a data signal prediction section that predicts reception power of the data signal based on the measured reception power

of the known signal; a power comparison section that compares the reception power of the data signal predicted by said data signal prediction section. Uskali et al. discloses having a receiver comprised of a demodulator 20 including a signal quality estimator 33 ("data signal prediction section") estimating means whereby estimates the desired input signal-to-noise ratio (SNR," reception power", column 5 line 65-67 and column 6 line 1-5). Uskali et al. further discloses corresponding a staggering value C to the signal-to-noise ratio (SNR," reception power", column 6 line 1-20).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have detecting and measuring each branch sub-carriers as taught by Dolgonos et al. utilizing a signal quality estimator 33 ("data signal prediction section") estimating means whereby estimates the desired input signal-to-noise ratio (SNR," reception power") as taught by Uskali et al. providing an optimal receiving performance.

Dolgonos et al. does not explicitly discloses *a collision position detection section that detects positions of data symbols colliding with each other between a plurality of cells by detecting positions where there is a large variation of said measured reception power of the data signal with respect to said predicted reception power of the data signal based on the comparison result obtained by said power comparison section.* Belotsererkovsky et al. discloses having a OFDM receiver that detects and corrects a sampling frequency offset of a sampled signal ( abstract)...a time -domain windowing module 124 ("collision position detection section", column 7 line 15-26).

Belotsererkovsky et al. further discloses calculating the difference between the frequency bin ("measured reception power") and the pilot bin (" predicted reception power") which done by a sampling frequency error computation module 128 ("power comparison section")

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have having a wireless communication system 10 as taught by Dolgonos et al. time -domain windowing module 124 ("collision position detection section") and further utilizing a sampling frequency error computation module 128 ("power comparison section") whereby computes frequency bin ("measured reception power") and the pilot bin (" predicted reception power") as taught by Belotsererkovsky et al. efficiently transmitting data over a channel.

**4. Claims 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Do et al. (US Patent 6,798,738) in view of Uskali et al. (US Patent 6,753,423) and Belotsererkovsky et al.(US Patent 6,628,735) and Hyakudai et al. (US Patent 6,720,824).

**With regard to claim 3,** Do et al. discloses having an *OFDM reception apparatus that receives and demodulates an OFDM signal, comprising: a known signal measuring section that measures reception power of a known signal*; Do et al. discloses

having a OFDM receiver ... a power detector 322(" section that measures reception power of a know signal", ) receiving a OFDM signal ( column 3 line 1-7).

*a data signal measuring section that measures reception power of a data signal;* Do et al. discloses having a OFDM receiver ... a power detector 322(" section that measures reception power of a know signal", ) receiving a OFDM signal ( column 3 line 1-7).

Do et al. does not explicitly discloses having a *data signal prediction section that predicts reception power of the data signal based on the measured reception power of the known signal*; Uskali et al. discloses having a receiver comprised of a demodulator 20 including a signal quality estimator 33 ("data signal prediction section") estimating means whereby estimates the desired input signal-to-noise ratio (SNR," reception power", column 5 line 65-67 and column 6 line 1-5).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to implement a OFDM receiver as taught by Do et al. incorporating a signal quality estimator 33 ("data signal prediction section") estimating means whereby estimates the desired input signal-to-noise ratio (SNR," reception power") as taught by Uskali et al. providing an optimal receiving performance.

*a power comparison section that compares the reception power of the data signal predicted by said data signal prediction section with the reception power of the data signal measured by said data signal measuring section for each subcarrier;* Do et al. discloses having a FFT window using a power difference between received signals in a predetermined section of the OFDM receiver ( "power comparison", column 2 line 14-17). However, Do et al. does not discloses having a said data signal prediction section with the reception power of the data signal measured by said data signal measuring section for each subcarrier. Uskali et al. discloses having a receiver comprised of a demodulator 20 including a signal quality estimator 33 ("data signal prediction section") estimating means whereby estimates the desired input signal-to-noise ratio (SNR," reception power", column 5 line 65-67 and column 6 line 1-5).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to implement a OFDM receiver as taught by Do et al. incorporating a signal quality estimator 33 ("data signal prediction section") estimating means whereby estimates the desired input signal-to-noise ratio (SNR," reception power") as taught by Uskali et al. providing an optimal receiving performance.

*a collision position detection section that detects positions of data symbols colliding with each other between a plurality of cells by detecting positions where there is a large variation of said measured reception power of the data signal with respect to said predicted reception power of the data signal based on the comparison result obtained by said power comparison section;* Do et al. discloses having a minimum value



position detector 328 ("collision position detector", column 3 line 7). However, Do et al. does not explicitly disclose having a collision position detection section that detects positions of data symbols colliding with each other between a plurality of cells by detecting positions where there is a large variation of said measured reception power of the data signal with respect to said predicted reception power of the data signal based on the comparison result obtained by said power comparison section; Belotsererkovsky et al. discloses having a OFDM receiver that detects and corrects a sampling frequency offset of a sampled signal ( abstract)...a time -domain windowing module 124 ("collision position detection section", column 7 line 15-26). Belotsererkovsky et al. further discloses calculating the difference between the frequency bin ("measured reception power") and the pilot bin (" predicted reception power") which done by a sampling frequency error computation module 128 ("power comparison section", column 7 line 59-67).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a OFDM receiver as taught by Do et al. incorporating a time -domain windowing module 124 ("collision position detection section") and further utilizing a sampling frequency error computation module 128 ("power comparison section") whereby computes frequency bin ("measured reception power") and the pilot bin (" predicted reception power") as taught by Belotsererkovsky et al. efficiently transmitting data over a channel.

Do et al. does not explicitly discloses having an *error correcting decoding section that applies error correcting decoding processing to the received OFDM signal by reducing likelihood of data symbols positions at which said collision position detection section has detected the collision*. Hyakudai et al. discloses having a demodulation method and apparatus (title) ...a OFDM reception apparatus 1 comprised of a fc correction circuit 7 ("error correcting decoding section") process OFDM signals, in order to correct OFDM time domain signals ("reducing the likelihood of data symbol position collision", column 13 line 6-45).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a OFDM receiver as taught by Do et al. incorporating a a fc correction circuit 7 ("error correcting decoding section") process OFDM signals, in order to correct OFDM time domain signals ("reducing the likelihood of data symbol position collision") as taught by Hyakudai et al. efficiently transmitting data over a channel.

### ***Allowable Subject Matter***

5. **Claims 2, and 4-6** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
6. **Claims 7 and 8** are allowed.

### ***Prior Art***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kim et al. ( US Patent 7,110,387) discloses having a system and method for compensating timing error using pilot symbol in OFDM/CDMA communication system.

Okada et al. ( US patent 7,075,949) discloses having a OFDM receiving device and OFDM receiving device.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DeWanda Samuel whose telephone number is (571) 270-1213. The examiner can normally be reached on Monday- Thursday 8:30-5:30 EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Q. Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:  
10/542,772  
Art Unit: 2616

Page 11

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DeWanda Samuel  
12/26/2007

  
RICKY Q. NGO  
SUPERVISORY PATENT EXAMINER